

Elders' Knowledge About Risk Factors of Coronary Heart Disease, Their Perceived Risk, and Adopted Preventive Behaviors

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Abstract

Coronary heart disease is the most frequent single cause of death among persons over 65 years of age and it seems to continue to be a significant threat to the health and wellbeing of the elderly population all over the world, yet the condition is largely preventable. **The aims of this study** to assess and determine the relations among elder's knowledge about risk factors, perception of risk, and adopted preventive behaviors of CHD. **Design:** Descriptive research design. **Subjects:** The study subjects comprised 150 elders free of coronary heart disease selected from six elderly homes in Alexandria, Egypt, four governmental and two private. **Conclusion:** Elders' knowledge about CHD risk factors and their perception of risk and adopted preventive behaviors were generally low among elders. Knowledge about CHD risk factors and risk perception affected positively commitment of elders to the preventive behaviors of CHD.

Keywords: Coronary heart disease, older adults, risk factors, perception, prevention.

Introduction:

Coronary or ischemic heart disease (CHD) is a condition that happens when the arteries that supply blood to the heart muscle become hardened and narrowed due to the buildup of cholesterol and other materials, called plaque, on their inner walls. As the buildup grows, less blood can flow through the arteries to the heart muscle which in turn can't get the blood or oxygen it needs. This maybe manifested by angina pectoris, myocardial infarction, or sudden death (Meiner et al 2007).

According to the World Health Organization, CHD is the most frequent single cause of death among persons over 65 years of age between 2002 und 2012 and it seems to continue to be a significant threat to the health and wellbeing of the elderly population all over the world (WHO 2012). Many contributing risk factors lead to CHD. The majority of them can be controlled or modified. Among the modifiable risk factors are physical inactivity, diet rich in fat, smoking, obesity, excessive alcohol intake, poor stress management, social isolation and diseases like diabetes and hypertension. Non-modifiable risk factors include increasing age, sex and heredity (Yusuf et al 2004). Worldwide 80% to 90% of people dying from CHD have one or more major risk factors that are influenced by lifestyle (Mackay et al 2004).

The incidence of CHD increases with age, especially after 65 years (Fancher et al 2004). This is mainly due to physiological and morphological changes affecting the cardiovascular system and the presence of multiple chronic diseases such as diabetes and hypertension that profoundly accelerate the pathological process of CHD (Meiner et al 2007). Increased attention, nowadays, is being focused on prevention and early treatment of CHD. In the USA, during 2001 to 2011, the death rate from heart disease has fallen about 39 percent. This decline can be attributed to the efforts of people to become generally healthier and individual initiative to alter unhealthy and hazardous life styles (American Heart Association 2014). Modification of lifestyle factors (maintain normal weight and physical activity, smoking cessation, healthy eating...) even later in life, has considerable potential for primary prevention of CHD (Wannamethee et al 2006).

Knowledge of modifiable risk factors for heart diseases has been identified as a prerequisite for change in behavior and is often targeted by prevention programs (Louise et al 2000). Although knowledge alone is insufficient, it is assumed to be a key component of behavioral change decision making, and provides cues for action (Khan et al 2006). Also, Perceived risk of illness -which is referred to as susceptibility or vulnerability- is considered as another essential variable that encourages individual towards making healthy behavioral changes (Weinstein et al 1992). Even though the literature review did not strongly elaborate on the relation between the perceived risk and health related behavior in the older persons (Mobbs 2009), there is empirical evidence to support this connection in other populations (Wendt et al 2005, Skinner et al 1998).

Understanding elders' self-rated CHD risk perception and its association with knowledge about risk factors and preventive behavior are very important for nurses, as health educators, to give appropriate health education, and most important step towards encouraging elders to take risk-reducing actions (Tabloski 2006). Therefore this study aims to assess and determine the relations among elder's knowledge about risk factors, perception of risk, and adopted preventive behaviors of CHD.

MATERIALS AND METHOD

Materials:

1-Design: Descriptive study

2-Settings: This study was carried out in six elderly homes in Alexandria, Egypt, four governmental and two private selected randomly by ballot out of all elderly homes in Alexandria.

3-Subjects: The study subjects comprised all residents living in the previous settings and fulfilling the following criteria:

1. Age of 60 years and older.
2. Both sexes (male and female).
3. Free of coronary heart disease or its sequels (angina and MI).
4. Able to communicate verbally and mentally capable of being interviewed i.e. with no cognitive impairment.
5. Willing to participate in the study.

The study subjects amounted to 150 older adults.

4-Tools: Three tools were used to collect the necessary data.

Tool I: Mini Mental State Examination Scale (MMSE):

This tool was developed by Folstein and McHugh, 1975(Folstein 1975), translated into Arabic and tested for validity and reliability in different studies carried out in Alexandria(Shafik2000, Fouad 2000, Abdell-rahman 2004) with a reliability coefficient of ($r=0.96$) (Hallaj 2007). The scale is the most widely reliable and used instrument for screening cognitive disorders. It consists of 10 items that investigate the memory, orientation to time and place, attention, calculation, naming, repetition, registration, language, praxis and coping of design. Scoring is based on the number of correct items, with a maximum of thirty points possible.

The MMSE score is related to both age and educational level. There is inverse relation between abnormal cutoff point of MMSE score and age, ranging from 28 to 30 for elders between ages 60-64 years, 27 for elders between 65-74 years, 26 for elders between 75-84 years and 24 to for those 85 years and older. Inverse relation is also proofed in relation to educational level, normal MMSE score is 29 for individuals with at least 9 years of schooling, 26 for those with 5 to 8 years of schooling, and 22 for those with 0 to 4years of schooling (Crum 1993).In order to identify the subjects to be included in the study, both elder's age and educational level were assessed in the beginning to determine both cutoff points, then MMSE score was calculate and compared to the least one.

Tool II: knowledge about risk factors and perception of risk of CHD, Structured interview schedule: This tool was developed by the researcher based on relevant literature and consists of three parts:

Part 1: Elder's profile: This part included items related to:

1. Socio demographic characteristics of the elders such as age, sex, and occupation before retirement.
2. Medical history: past and present chronic diseases (cardiovascular, endocrine, nervous, etc) and its duration.
3. Risk behaviors such as smoking habits and excessive caffeine consumption.

Part 2: Knowledge about CHD risk factors

The knowledge of CHD risk factors was assessed using single open-ended question asking older adults to name as many as they could of risk factors believed to cause or to be associated with CHD. The suggested answers included age, sex, family history, smoking, physical inactivity, saturated fat intake, obesity, hypertension, diabetes, stress, and alcohol intake. Each of the mentioned risk factor was scored one point to yield a potential total of eleven points. This method was selected because it indicates more actual recognition and awareness of risk factors rather than the method of asking participants to select true risk factors from a list of correct and distrusted items (Jo 2004, Saskia 2009)

Part 3: Perception of CHD risk.

This part included statements to assess the perception of elders about their risk of having CHD in their life, the social class they believe to be mostly affected by CHD, risk of having CHD compared to other elders in same age and circumstances and risk of having CHD compared to other diseases. Scoring system differ among questions, the question which ask elder to name the social class they believe to be mostly affected CHD assigned one point if the elder mention (all people), otherwise they gain 0. latter questions had answers with 3 options likert scale, their score ranging from 0: (less),1:(same) and 2:(more) . Scores of all questions then summed to give a total score of 7 points.

Tool III: Adopted preventive behaviors checklist.

This checklist developed by the researcher based on the review of relevant literature, it comprised statements to identify elder's adopted preventive behaviors to avoid or reduce modifiable risk factors of CHD. These include behaviors related to nutritional habits, physical activity, stress management, personal health responsibility and social relations. Every preventive behavior adopted by elderly was scored one point to yield a potential total score of 24 points.

Method:

- 1) Permission of Ministry of Social Solidarity and the director of each of the selected elderly home were

obtained after the explanation of the aim of the study.

- 2) Tool II and tool III were developed by the researcher based on thorough review of relevant literature. They were tested for content validity by 9 experts in the related fields of Gerontological Nursing, Psychiatric Nursing, Medical Surgical Nursing, and Geriatric Medicine. The necessary modifications were done accordingly. Reliability of both tools was tested using test retest method (after 2 weeks). The study tools were applied to 10 residents' older adults. Spearman's correlation coefficient for tool II was $r=0.87$, and for tool III $r=0.90$.
- 3) Informed consent to participate in the study was obtained from each elder after explanation of the study purpose. All participants were assured that joining the study is on a voluntary basis, and that they can withdraw from the study at any time without penalty.
- 4) A pilot study was carried out on 10 elderly persons to assess the clarity and applicability of the tools and necessary modifications were done accordingly.
- 5) The process of identifying the study subjects according to the inclusion criteria was accomplished through two phases:1) The researcher surveyed medical records of all residents in the selected study settings to ascertain those fulfilling the study criteria , mainly age above 60 years and free from coronary heart disease, In case information was not available in the medical records, it was obtained either from the responsible nurse in the elderly home or from the older adults themselves by reviewing their medications.2) Then tool (1) MMSE was applied to each of the selected elderly. The score obtained by each was compared with the normal cutoff points to determine those with no cognitive impairment to be included in the study.
- 6) Confidentiality of the collected data was assured.
- 7) Older adults fulfilling the inclusion criteria were interviewed individually to collect the necessary information. After the completion of the study tools, the researcher answered the questions raised by elders concerning CHD.
- 8) The researcher visited each of the elderly homes four days /week .The interview lasted for about 30-40 minutes depending on the level of understanding and cooperation of the elderly person.

Statistical analysis:

Data was analyzed using PC with statistical package for social science (SPSS) version 15. The 0.05 level was used as the cutoff value for statistical significance.

Results:

Table (1): Distribution of older adults according to their sociodemographic characteristics:

Items	n=150	%
Age (in years):		
60-	106	70.67
75-	28	18.66
85-	16	10.67
Mean \pm SD	72.02 \pm 8.15	
Sex		
Male	57	38.00
Female	93	62.00
Level of education		
Illiterate	37	24.67
Read & write	17	11.33
School education	58	38.67
University or higher	38	25.33

Table 1 shows the sociodemographic characteristics of studied subjects, The elder's age ranged from 60 to 98 years, with a mean age of 72.02 ± 8.15 years. Elders aged 60 to less than 75 years constituted 70.76% of studied subjects. About two thirds of elders 62.0% were females. Concerning the level of education, 24.67% of the subjects were illiterate and (11.33)% could just read and write. Elders with school education constituted 38.67% of all subjects. Only 25.33% of the participants were holding university degree or higher.

Table (2): Distribution of elders according to the number of identified risk factors for CHD:

Number of risk factors	n=150	%
0	41	27.33
1	48	32.00
2	40	26.67
3	14	9.33
4+	7	4.67
Mean ± SD	1.35±1.25	

As shown in table 2, among all participants, 27.33% did not mention any of the risk factors for CHD. Those who mentioned either one or two risk factors amounted to 32.0% and 26.67% respectively. Only 4.67% of elders were able to identify 4 or more risk factors.

Table (3): Distribution of older adults according to their Knowledge about risk factors of CHD

Risk factors #	n=150	%
Stress	73	48.67
Fatty food	52	34.67
Smoking	32	21.33
Sedentary lifestyle	10	6.67
Hypertension	8	5.33
Ageing	8	5.33
Obesity	7	4.67
Diabetes	4	2.67
Alcohol consumption	4	2.67
Heredity	3	2.00
Sex	0	0.0
None of the above	41	27.33

Multi-response variable

Table 3 shows the distribution of elders according to their knowledge about risk factors of CHD. The most frequently reported risk factor was stress 48.67 %, followed by increase fatty food 34.67% and smoking 21.33 %. Although sedentary lifestyle, hypertension, ageing and obesity are among the important risk factors leading to CHD, yet they were identified by only 6.67%, 5.33 %, 5.33 % and 4.76 % respectively. Diabetes (2.67%), alcohol consumption (2.67%) and heredity (2.0%) were the least identified risk factors. None of the elders mentioned sex as one of the risk factors. As well, more than a quarter of the participants 27, 33 had no knowledge about the risk factors of CHD.

Table (4): Distribution of older adults according to their risk perception of developing CHD:

Risk perception	Response	N=150	%
1) Concern over having a CHD in lifetime.	No	128	85.33
	Sometimes	14	9.33
	Always	8	5.33
2) Social class mostly at risk:	All people	110	73.33
	Upper social class	31	20.67
	Middle social class	1	0.67
	Low social class	8	5.33
3) Risk compared to other elders of the same age and circumstances:	Less than others	88	58.67
	Same	57	38.00
	More than others	5	3.33
4) Risk of acquiring CHD compared to other diseases:	Less than other diseases	33	22.00
	Same to other diseases	110	73.33
	More than other disease	7	4.67

Table 4 shows the distribution of elders according to their risk perception of developing CHD. Most of the respondents 85.33% doesn't perceive themselves at risk of having CHD in their lifetime. Nearly 3/4 of elders (73.33 %) believe that all people, regardless of the social class, are at risk for acquiring CHD. More than half of the subjects (58.67%) believe that they have lower probability of developing CHD, (38.0%) reported that they have the same probability and only 3.33% believe that they have more probability for the disease than other elders of the same age and circumstances. Most of elders (73.33%) think that they have the same probability of acquiring CHD as any other disease (cancer, stroke ...), 22.0% believe that the chance for acquiring CHD is less than the other diseases and less than 5.0% perceive that CHD is more likely of develop compared to other

diseases.

Table (5) Mean and standard deviation of adopted CHD preventive behaviors among elders:

Preventive behavior for CHD	Mean±Sd	Maximum score
Healthy dietary pattern	7.16±1.559	9
Positive health responsibility	2.61±1.284	5
positive social relationships	2.49±1.355	5
Physical activities	1.09±1.006	3
Positive stress management behavior	0.43±0.496	1
Total HPLP	13.78±3.640	24

The findings in table 5 shows that the heights adopted preventive behaviors was healthy dietary pattern (7.16 ± 1.559) followed by positive health responsibility, positive social relationships and physical activity. The mean of adopted positive stress management behavior was 0.43 ± 0.496 . Generally, the mean of adopted preventive behavior for CHD was in weak level among elders (13.78 ± 3.640).

Table (6): Relation between educational level and mean score of knowledge about CHD risk factors, risk perception and adopted preventive behaviors.

Educational levels	Knowledge about CHD risk factors	Risk perception	Adopted preventive behaviors
	Mean ± SD	Mean ± SD	Mean ± SD
Illiterate/Read and write n=54	1.02±0.921	2.06±1.250	11.61±3.384
School education n=58	1.19±1.083	2.67±1.094	14.74±3.104
University or higher n=38	1.95±1.184	2.53±1.202	15.39±3.333
Significance	F=9.356 p=0.000*	F=4.168 p=0.017*	F=19.076 p=0.000*

Table 6 shows the relation between educational level and mean score of knowledge about CHD risk factors, risk perception and adopted preventive behaviors. A significant relation was found between the elders' educational level and their knowledge about CHD risk factors, risk perception and adopted preventive behaviors, $p=0.000^*$, $p=0.017^*$ and $p=0.000^*$ respectively, the higher the educational level the increase in knowledge about CHD risk factors, risk perception and adopted preventive behaviors.

Table (7): Relation between presence of hypertension or diabetes mellitus (DM) and mean score of knowledge about CHD risk factors, risk perception and adopted preventive behaviors.

Type of diseases		Knowledge about CHD risk factors	Risk perception	Adopted preventive behaviors
		Mean ± SD	Mean ± SD	Mean ± SD
Hypertension	Yes n=72	1.24±1.041	2.36±1.335	13.40±3.519
	No n=78	1.40±1.177	2.46±1.041	14.13±3.736
Significance		t=-0.886 p=0.377	t=-0.511 p=0.610	t=1.222 p=0.224
Diabetes mellitus	Yes n=50	1.26±1.065	2.50±1.446	13.96±3.923
	No n=100	1.35±1.140	2.37±1.041	13.69±3.507
Significance		t=0.466 p=0.642	t=5.66 p=0.573	t=0.427 p=0.670

As shown in Table 7, although hypertension and DM are two of the important risk factors for CHD, yet no statistical significant difference was found between elders suffering from hypertension and other free from it in relation to the studied variables, $p=0.377$, $p=0.219$ and $p=0.224$ respectively for knowledge, perception and preventive behaviors. The same was observed with those suffer from diabetes mellitus, $p=0.642$, $p=0.573$ and $p=0.670$ respectively for knowledge about CHD risk factors, risk perception, and adopted preventive behaviors.

Table (8): Relation between knowing someone with CHD and mean score of knowledge about CHD risk factors, risk perception and adopted preventive behaviors.

Know someone with CHD	Knowledge about CHD risk factors	Risk perception	Adopted preventive behaviors
	Mean ± SD	Mean ± SD	Mean ± SD
Yes n=45	1.78±1.064	2.84±1.397	14.91±3.437
No n=105	1.12±1.080	2.23±1.040	13.30±3.632
Significance	t=3.413 p=0.001*	t=2.985 p=0.003*	t=2.537 p=0.012*

As it can be found in table 8, elders who reported knowing someone suffering from CHD had significantly more knowledge, risk perception and adopt preventive behaviors than others, $p=0.001$ $p=0.012$ and

p=0.003 respectively.

Table (9): Correlation among knowledge about CHD risk factors, CHD risk perception and adopted preventive behaviors

	Knowledge about CHD risk factors		Risk perception		Adopted preventive behaviors	
	R	P	R	P	R	P
▪ Knowledge about CHD risk factors	1					
▪ Risk perception	+ 0.138	0.093	1			
▪ adopted preventive behaviors	+ 0.355	0.000*	+ 0.209	0.010*	1	

Table 9 shows the correlation among knowledge about CHD risk factors, risk perception and adopted preventive behaviors: knowledge about CHD risk factors was positively and moderately correlated with the adopted preventive behaviors $r=0.386$, $p=0.000$. In addition, CHD risk perception was positively and weakly correlated with adopted preventive behaviors $r=0.209$, $p=0.010^*$. However, no significant correlation between knowledge about CHD risk factors and risk perception $r=0.122$, $p=0.138$.

Discussion:

Now days, a great deal of interest is directed toward motivating and increasing adherence of elderly people to healthy lifestyle behaviors as a preventive measure to avoid the risk of developing many chronic conditions particularly CHD. Healthy lifestyle behaviors include items such as, maintaining healthy eating, optimum level of physical activity, appropriate weight, effective stress management and supportive social network (David et al 1999). These are the cornerstone for prevention of CHD among elderly people and are reported to result in 90% reduction in the incidence of CHD (Physical activity and public health guidelines 2009).

In order to avoid these risk behaviors, elders should be equipped with knowledge about risk factors and motivated to change their risk behaviors. The present study revealed that one quarter of the respondents were unable to identify any of these risk factors and only one elderly mentioned nine of them. The rest of the participants knew just few of them (less than 4), the mean number of identified risk factors was 1.35 ± 1.25 (table 2). Higher mean score (2.45 ± 1) was reported in another study carried out in Hong Kong (2007) (Wu 2007).

In this study, it was noted that stress was the most frequently reported risk factor by the elders, followed by eating fatty food, smoking, sedentary lifestyle and hypertension (table 3). This is going in accordance with another study carried out in Pakistan (2004) (Dodani et al 2004) while in Canada (1999), stress was also the main risk factor identified by elders, followed by smoking, obesity, sedentary lifestyle, fatty food and heredity (Kirkland et al 1999).

Perception of elders about their risk of having CHD is generally thought as boost up factor that encourage and support them to adopt preventive behaviors that reduce their risk, such as smoking cessation, weight loss, and medication compliance (Carol et al 2008). Elders in the present study showed an optimistic bias toward their future risk of having CHD. Most of the respondents do not perceive themselves at risk of acquiring CHD in their lifetime, and the majority perceive themselves less than others toward the possibility of having CHD in their lifetime (table 4). This is supported by the findings of a similar research carried out among elderly in Thailand (Pothiban 1993), which suggested that elders tend to rate their own risk as lower than their peers. This may be attributed to the perception of elders about their health, where in case of absence of signs or symptoms, the elders still perceive themselves far away from the harm and therefore, do not consider themselves as being at risk for CHD. This rational was confirmed in the present study where only one third of the elders do regular follow up and less than one fifth seek health information (table 10). In Egypt, a study carried out in elderly homes in Alexandria 2008 showed that the majority of elders perceived themselves as healthy because they are just independent in their activity of daily living (Hussein 2008).

As regard preventive behaviors, In the present study, elderly have the highest mean item score in nutrition, this could be understood in the light of healthy dietary pattern (Mediterranean diet) commonly followed in Egypt and other Mediterranean region. Mediterranean diet has been approved in many epidemiological and cohort studies as an independent preventive factor for CHD (Dontas et al 2007). The majority of elders were physically inactive which, in turn, increase their risk for acquiring CHD (table 8). The same was reported in other studies carried out among institutionalized elders in Alexandria where about two thirds of elders were either irregularly active or completely sedentary (Hallaj 2007) and (Mahrouse 2009). The same was reported in other studies in China (Williams et al 2007), Iran (Morowatisharifabad et al 2006), and UK (Shankar et al 2010). Stress management is considered one of the important measures to avoid CHD, the study

revealed that more than half of the elders do not adopt any specific measure in case of stress(table 9). In Egypt, a study carried out in elderly homes in Alexandria revealed that majority of elders was reported anxiety feeling (Mahfouze 2005). This result is comparable with the findings from other studies carried out in Iran (Morowatisharifabad et al 2006) and Korea (Kim et al 2006) where elders in these studies reported lower adoption to stress management techniques.

Moreover, although many elders believe in the importance of social relations, yet only a quarter to half of them reported positive social activities (table 11).This is in line with other studies carried among institutionalized older adults in Egypt, Alexandria (Mabrouk 2009) , (El-Kholy 2008). In Egypt, Cairo (2005) revealed that majority of elders don't have intimate relations with others and more than one third of them do not have any social support system (Elbishi 2005). Similar results were reported from USA (Winningham 2007) where older adults reported their needs for more social support and in Korea (Kim et al 2006) where institutionalized elders had less social support than community dwelling elders.

Higher levels of education could have direct effects on health status through greater health knowledge acquired during schooling and greater personal empowerment and self efficacy (Smith et al 1998) ⁽¹⁷⁰⁾, It also may have indirect effects through the positive effect of education on job opportunities, annual income, housing, and access to nutritious foods (Elo et al 1989) .Results from this study are consistent with literature, where the educational level of participants affected positively and significantly their knowledge about CHD risk factors, perceived risk and adopted preventive behaviors. Specifically, elders who were illiterate or just read and write possessed lowest means of knowledge, perception and preventive behaviors than literate ones (table 14). These results were expected because elders with high educational level are more able to attend health related programs and understand information about health topics (Saskia 2009). Similar findings were reported in another study in El-Mansoura (Mohammed 2009) . This is comparable with other studies in Canada (Kirkland 1999) , Pakistan (Louise et al 2006) , Hong Kong (Mosca 2007) , and UK (Saskia 2009) that reported significant relation between educational level and knowledge of CHD risk factors. Findings from previous studies in USA (Avis 1996), Canada (Kang 2010) , Pakistan (Louise et al 2006) suggested education as a protective factor for coronary heart disease.

The current study reported that the level of education was positively and significantly related to perception of CHD risk. Consistent findings from other studies revealed that the level of education was positively related to the increase in risk perception of CHD, USA (Oliver 2002) (Shiplett 2007) and Hong Kong (Wu 2007) . Perhaps these results can be attributed to the fact that elders with higher education level possess better understanding of the impact that coronary heart disease may have on their life. Once risk factors are known and understood, elders can take steps to reduce their chances of developing heart disease (Shiplett 2007). From the findings of the present study, adopted preventive behavior was significantly associated with the educational level of the participants. That is, the better-educated individuals assume better preventive behaviors (table 14). This finding is congruent with the findings of other studies carried out in Hong Kong (Wu 2007) and UK (Shankar et al 2010) . Elders with higher education were more likely to have higher cognitive function and better comprehension capability so that they might understand the necessity of lifestyle changes, be more motivated, and perform health behaviors more often (Shankar et al 2010).

Patients with hypertension or diabetes have moderate to high susceptibility to develop CHD (Wu 2007) , and Occurrences of these diseases have to be harmonized with increased patients' awareness about CHD. Unexpectedly, Hypertensive or diabetic elders in this study did not show higher knowledge, risk perception or adopted preventive behaviors than other counterparts. The same results were reported from other studies carried in USA (Zerwic et al 1997) and Netherland (Ali 2002) which reported that specifically older patients with hypertension or diabetes had less perception about CHD risk than younger patients. These findings raise questions about health education that patients with hypertension or DM should receive as prevention for CHD.

In this study, knowing someone with CHD appears to have a significant relation on knowledge about CHD risk factors, risk perception and adopted preventive behaviors. This is in agreement with the results from other studies in UK (Becker et al 1987) USA (Avis et al 1989) Netherland (Ali 2002).

Knowledge about risk factors of CHD, perception of risk and adoption of preventive behaviors are interrelated variable. It is generally thought that individuals having high knowledge and perceive themselves at higher risk of CHD are more likely to adopt preventive behaviors (Wu 2007) .Results from this study revealed positive and significant relation between knowledge about CHD risk factors and adopted preventive behaviors (table 17), indicating that better knowledge may be a motivation for more preventive behaviors. A large body of research suggests that increased health knowledge would contribute to a healthy lifestyle Sweden Carin et al 2004 and USA Mosca 2006.

Results from this study revealed Significant relation between perceived susceptibility and adopted preventive behaviors of CHD, this is consistent with other studies in USA (Mosca et al 2006) and (Shiplett et al 2007) .Other studies carried out in USA (Avis et al 1989) and (Oliver 2002) suggest opposite result where perceived susceptibility did not affect adopted preventive behaviors. No correlation between perceived

susceptibility and knowledge of major risk factors for CHD. This is comparable with other studies in USA (Webb 1996) and USA (Shiplett et al 2007) .These findings were inconsistent with the literature where perceptions of vulnerability were higher among women with greater knowledge about heart disease as their leading cause of death USA (Ali 2002) and Mosca 2006. Perhaps the inconsistency between the results may be due to using variety of methods to assess and calculate risk perception.

Conclusion:

Our findings suggest that elders' knowledge about CHD risk factors and their perception of risk and adopted preventive behaviors were generally low. High level of education and knowing someone suffer from CHD had positive effect on knowledge, risk perception and adopted preventive behaviors. Knowledge about CHD risk factors and risk perception affected positively commitment of elders to the preventive behaviors of CHD.

The main recommendations were:

1. Comprehensive assessment of elders in order to identify high risk behaviors conducive to CHD.
2. Conducting health education programs and health classes to elders with the intention to increase their knowledge about CHD risk factors, their perceived risk and adopted preventive behaviors.
3. It is recommended that elderly homes plan daily exercise activities and motivate their residents to avoid sedentary lifestyle by encouraging them to engage in moderate physical activity such as walking.

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